

UC San Diego

**IRWM PROPOSITION 1 DISADVANTAGED COMMUNITY INVOLVEMENT (DACI)
ACTIVITY 6
JUNE 3, 2020**

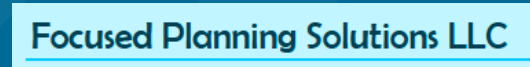
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ALTERNATIVE NON-POTABLE WATER SUPPLIES, XERISCAPE DESIGN AND FLOOD PREVENTION FOR DACS

DACI Activity 6

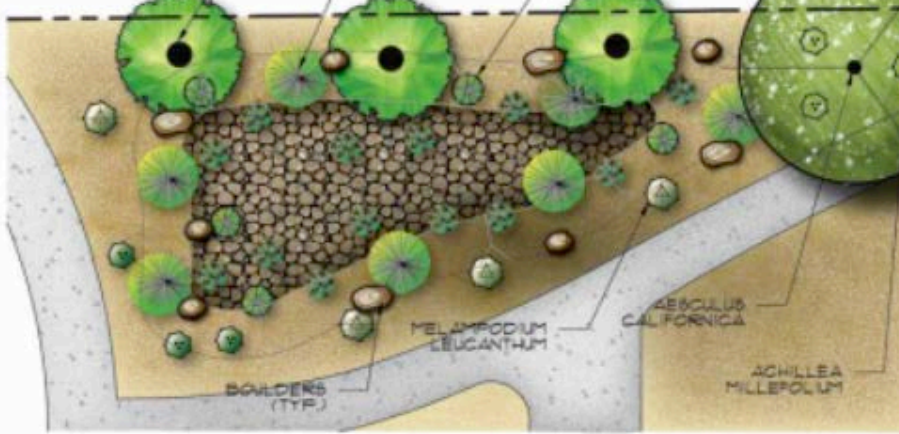


PROJECT CONTRIBUTORS



PRESENTATION OVERVIEW

1. PROJECT DESCRIPTION
2. TARGETED NEEDS ASSESSMENT FINDINGS
3. BENEFITS OF THE PROJECT
4. FINDINGS
5. COSTS
6. CHALLENGES
7. LESSONS LEARNED



PLANT LIST

SYMBOL	QTY.	NAME	SIZE	WATER USE
	1	ABOULIS CALIFORNICA CALIFORNIA BUCKEYE	20' H X 25' W	0.2 LOW
	9	MYRICA CALIFORNICA PACIFIC RAX MYRTLE	20' H X 15' W	0.2 LOW
	14	MULEBERGIA RIGENS DEER GRASS	4' H X 5' W	0.2 LOW
	10	CAREX BARBARAE BASKET SEDGE	15' H X 5' W	0.2 LOW
	26	JUNCUS PATENS ELK BLUE CALIFORNIA GRAY RUSH	2' H X 2' W	0.2 LOW
	8	MELAMPIDIUM LEUCANTHUM BLACKFOOT DAISY	1' H X 5' W	0.2 LOW
	12	ACHILLEA MILLEPOLIUM COMMON YARRON	2' H X 15' W	0.2 LOW



BMP TYPE	
BIORETENTION	

1. PROJECT DESCRIPTION

1. Project Description: Purpose

- Engage DAC residents in the **design** of effective use of alternative, non-potable water supplies, low water use xeriscapes, and flood mitigation strategies
- Expand **community understanding** of the safe and appropriate use of non-potable water
- Conduct robust **outreach** in targeted DACs to solicit input regarding their needs
- Collaboratively develop **resilient landscape designs** for sites in Chula Vista, Imperial Beach & on SDHC properties, incorporating community gardens and alternative non-potable water supplies



“Alternative non-potable water supplies” =

- (1) Rainwater harvesting
- (2) Laundry greywater to landscape discharge
- (3) Stormwater capture for landscape re-use

1. Project Description: Components/Tasks 1 & 2

Task 1. Administration: Project Dissemination

Task 2. DAC Outreach:

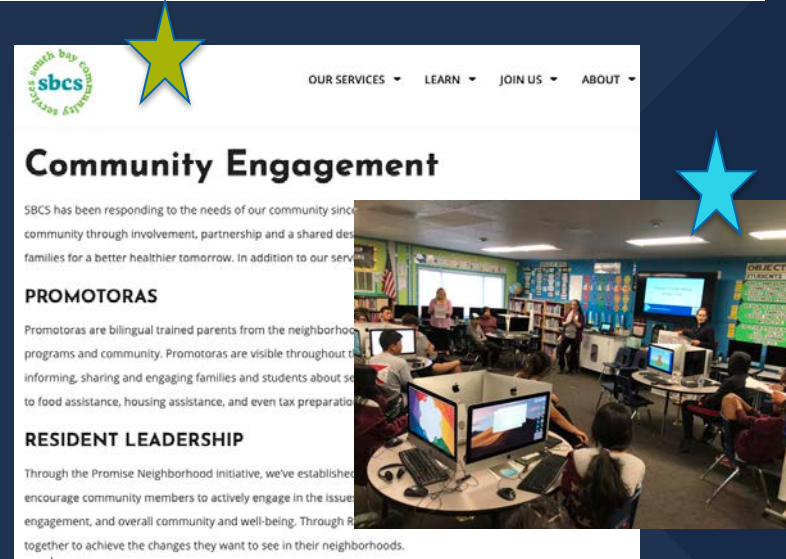
Identifying and engaging collaborators in Chula Vista, IB and through the SDHC to identify sites for collaborative design –“community weaving”

Key Collaborators, Chula Vista & Imperial Beach:

- ★ South Bay Community Services Promotoras & Resident Leadership Academy
- ★ Tijuana River National Estuarine Research Reserve
- ★ Feaster Charter School

Key Collaborators, SDHC Properties:

- ★ Maintenance technicians
- ★ Property managers

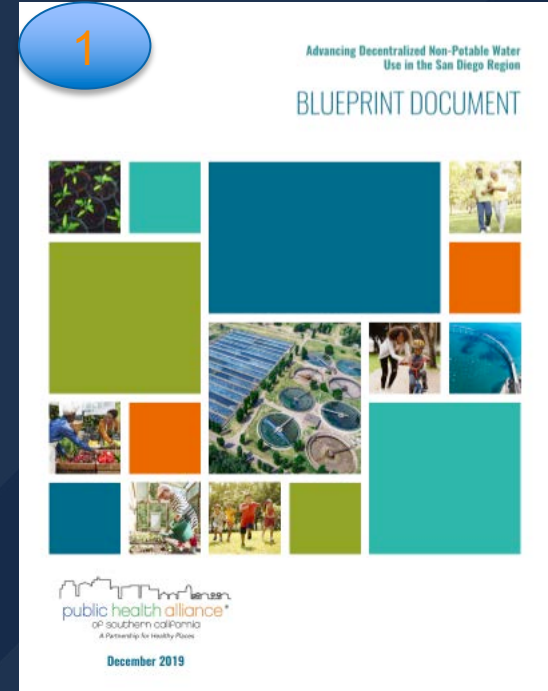
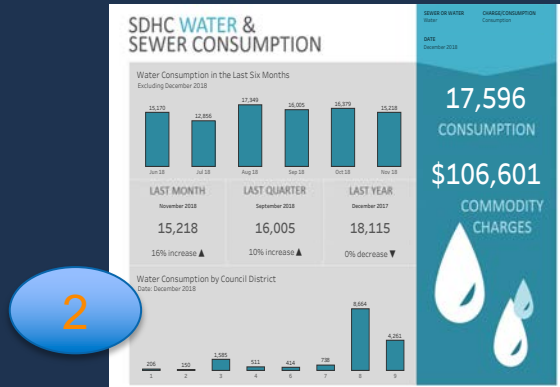


1. Project Description: Components/Task 3. Planning (1 of 2)

Task 3. Planning

Expanding understanding of alternative non-potable re-use in service of design through

- (1) Public Health Task Force & Regulatory Recommendations
- (2) SDHC Water Conservation Database coordination
- (3) Applying UCSD spatial analytics to identify design opportunities



1. Project Description: Components/Task 4. Design

Task 4. Design

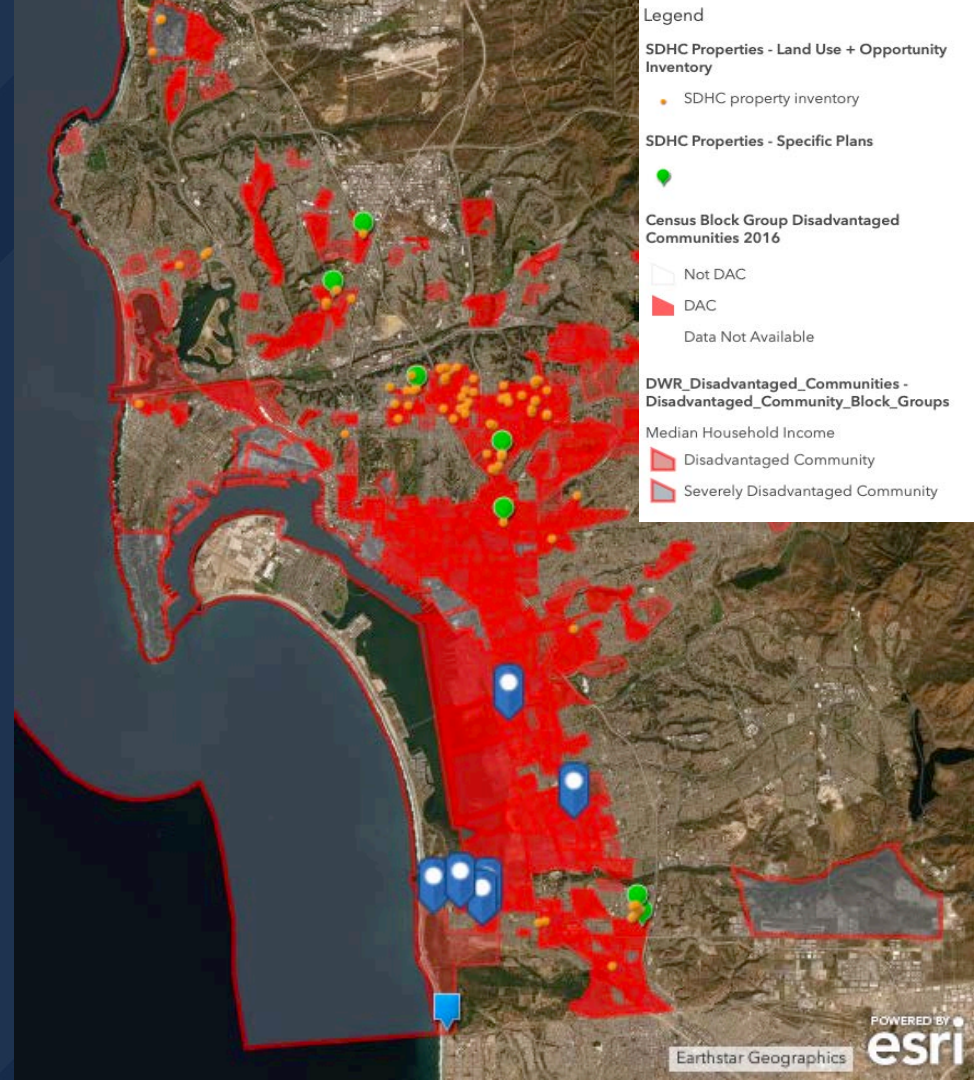
Through a collaborative process, develop designs including site plans incorporating xeriscape, alternative non-potable reuse, and flood prevention

Deliverable:

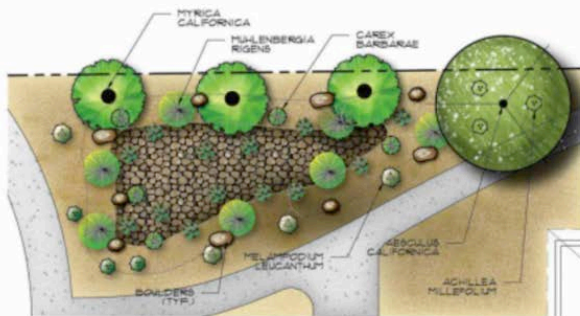
1. Typicals for San Diego Housing Commission
2. 2-3 plans in Chula Vista
3. 2-3 plans in Imperial Beach

Completed:

1. Typicals + 7 site-specific plans for SDHC
2. 3 plans in Chula Vista
3. 6 plans in Imperial Beach



Approach: Matrix of Landscape Types & Applicable BMPs



PLANT LIST

SYMBOL	QTY.	NAME	SIZE	WATER USE
	1	ABOUSIA CALIFORNICA CALIFORNIA BUCKEYE	20' H X 25' W	0.2 LOW
	3	MYRICA CALIFORNICA PACIFIC RAIN WINKLE	20' H X 15' W	0.2 LOW
	14	MUELENBERGIA RIGENS DEER GRASS	4' H X 5' W	0.2 LOW
	10	CAREX BARBARKAE BASKET SEDGE	15' H X 5' W	0.2 LOW
	26	JACQUIS MATENS SILK BLUE CALIFORNIA GRAY RUSH	2' H X 2' W	0.2 LOW
	8	MELAMPYRUM LEUCANTHUM BLACKFOOT Daisy	1' H X 5' W	0.2 LOW
	12	ACHILLEA MILLEFOLIUM COMMON YARROW	2' H X 15' W	0.2 LOW

TYPICAL BMP INSTALLATION COST ESTIMATES	
IMPLEMENTATION COMPONENT	BIORETENTION
Without Underdrains	\$4,000/70' to \$5,250/70'
With Underdrains	\$5,250/70' to \$7,250/70'
Reconstructed Pile	\$3,750/70' to \$4,250/70'
With Engineered Media	\$5,600/70' to \$5,400/70'
SOIL MEDIA BARRIERS	
Geotextile	\$0.55/70'
Washed Sand (2-inch layer)	\$0.25/70'
No. 8 Aggregate (soil 2 inches thick)	\$0.55/70'
UNDERDRAIN PIPE (Includes drainage stone, assumes 5-foot spacing)	\$1.75/70'
CURE AND CUTTER	\$22/70'
MULCH (Ranges from mixed hardwood to granite hair)	\$1.25/70' to \$1.55/70'
SOULDESX	\$100 each
CRUSHED AGGREGATE	\$1,300/70' to \$1,800/70'
HYDRAULIC RESTRICTION LAYER	
Filter Fabric	\$0.25/70'
Clay	\$0.25/70'
30-mil Liner	\$0.45/70'
Concrete Barrier	\$1.00/70'
VEGETATION	\$0.45/70' to \$1.00/70'
IRIGATION	\$1.75/70' to \$1.00/70'
IRIGATION CONTROLLER	\$1000
NOTES	
<ul style="list-style-type: none"> One tree for every 1000 sq.ft. At maturity 50% of landscape shall be covered with vegetation Verify plant locations 	

TYPICAL LANDSCAPE / BMP SOLUTIONS

SAN DIEGO HOUSING COMMISSION

STANDARD DESIGN PACKAGE



BMP TYPE
BIORETENTION

LANDSCAPE TYPE / SLOPE
OPEN SPACE / FLAT

SCALE
0 5 10
1/8" = 1'-0"



LPI.1

2. TARGETED NEEDS ASSESSMENT FINDINGS

UNDERSTANDING 'DISADVANTAGE': DETERMINANTS OF HEALTH



2. TARGETED NEEDS ASSESSMENT FINDINGS

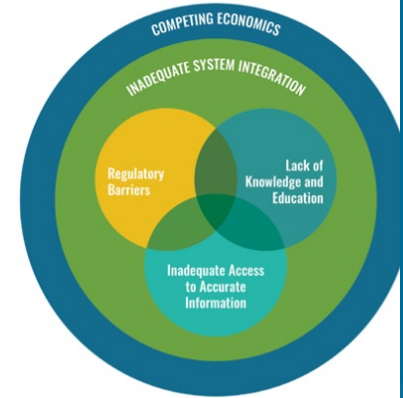
Needs Identified in the Application & Met through the Project

1. Address **gaps and barriers in the framework of regulations** for alternative non-potable water reuse in San Diego County
2. Providing **science translation, spatial analytics, and participation support** to engage DAC residents engage in collaborative design for understanding and use of non-potable water supplies, green infrastructure for flooding mitigation, and xeriscaping
3. Addressing the need to provide **new design standards** for SDHC landscapes to **reduce water use and transition to a xeriscape standard** that contributes to the regional conservation ethic

Why aren't we doing it?

Top barriers across all levels:

- Lack of education
- Lack of regulatory clarity



URBAN DAC ISSUES ADDRESSED IN THE DESIGNS:

IRWM Plan-Identified Issues:

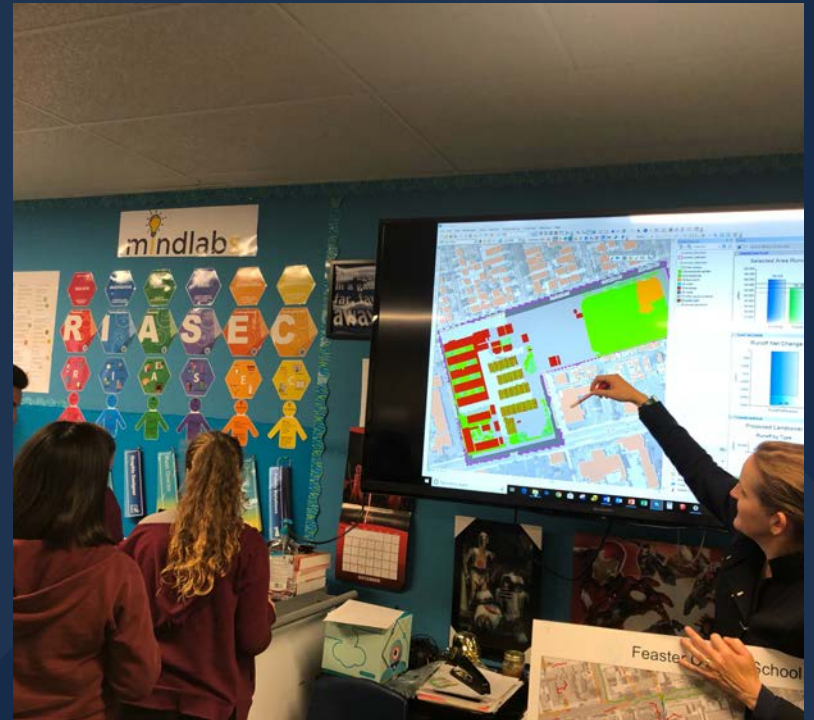
- Urban flooding
- Poor surface water quality
- Illegal dumping and trash
- High volume surface runoff
- Lack of recreational spaces

Additional issue:

- Need for safe use of alternative, non-potable water

Projects		Urban DAC Issues Addressed:					Safe Use of Alternative, Non-Potable Water
		Flooding due to inadequate facilities, impervious surfaces, vegetation overgrowth & trash	Poor Surface Water Quality	Illegal Dumping and Trash	High Volume Surface Runoff	Lack of Recreational Spaces	
San Diego Housing Commission Properties	Typical BMP Landscape Solutions	💧	💧	💧	💧	💧	💧
	Belden Village Senior Housing			💧		💧	💧
City of Chula Vista	Lauderbach Park				💧	💧	💧
	Mae L. Feaster Charter School	💧			💧	💧	
City of Imperial Beach	Monument Mesa/ Friendship Park (California State Parks)	💧	💧			💧	
	Laundry Building, Tijuana Estuary National Research Reserve				💧		💧
	13 th Street/ Bayshore Bikeway Improvements	💧	💧		💧	💧	
	Grove Street Green Street Improvements	💧	💧		💧		
	Oneonta Avenue/ Holly Avenue Flood Control	💧	💧		💧		
	Veteran's Park		💧			💧	
Public Health Alliance of Southern California <i>Blueprint</i>							💧

IRWM Need Met: Outreach & Education



IRWM Need Met: Financial & Technical Resources

Lauderbach Park Flow Path



CONTINUED BARRIERS TO DAC ENGAGEMENT

- Lack of Consideration for DAC Water Resource Needs in **School District design & planning processes**
- Lack of **financial support and incentives for implementation on multi-family and non-residential property** in some water districts
- Lack of institutional support for helping to **manage alternative non-potable water systems in community spaces** (i.e. legal, management)
- Challenges **engaging renters and rental property managers** outside SDHC



3. BENEFITS OF THE PROJECT

DIRECT ENGAGEMENT & PARTNERSHIPS DEVELOPED

Received information: 2,674

Attended & participated in a collaborative design workshop or site visit: 218

Replied to SDHC survey & Belden Village Senior Housing social mapping outreach: 172

Feaster Charter School 8th Graders using scenario planning software: 44

Organizations, agencies & businesses directly engaged: 25



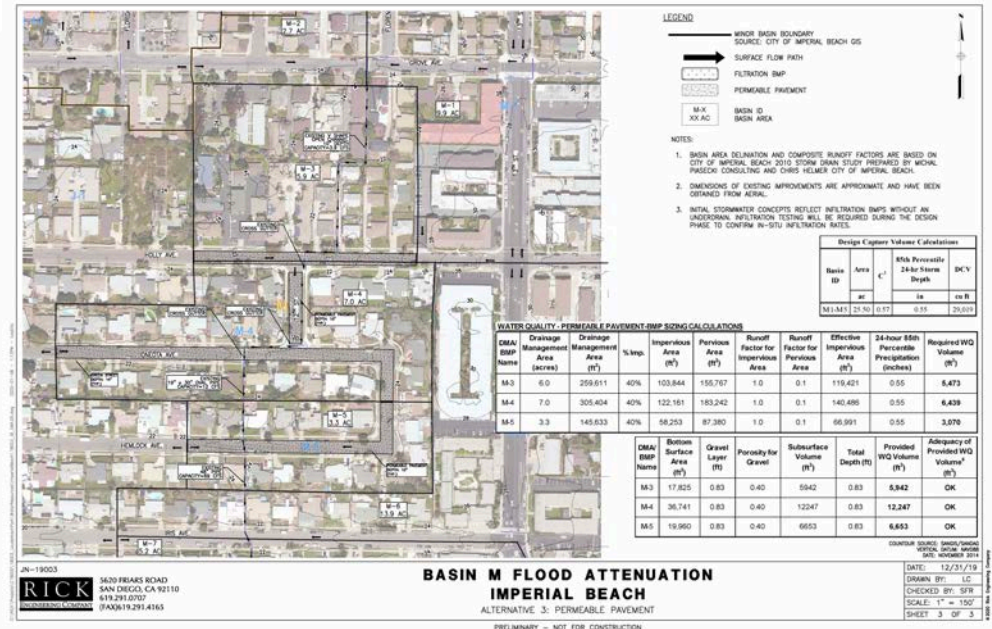
POTENTIAL WATER CAPTURE/SAVINGS

Implementation Cost Range:

\$12,500 (laundry greywater @ TRNERR) to \$3.2 million (landscape & hardscape renovation at Monument Mesa/Friendship Park, Borderfields State Park)

Potential benefits through implementation:

- Irrigation offsets: range from 6,109 – 513,490 gallons/year
- Capture & infiltrate: range from 4,167 to 185,831 gallons/1" storm
- Capture & reuse for community garden/ landscape: range from 1,260 – 20,000 gallons/year



5. COSTS

ACTIVITY 6 PROJECT COSTS

Task	Cost
Task 6.1 Project Management	\$95,588.00
Task 6.2 Outreach	\$331,962.62
Task 6.3 Planning	\$329,993.71
Task 6.4 Design	\$417,455.67
Project 6 Total	\$1,175,000

UCSD Share \$324,669

(staff, 3 student workers for 18 months + project administration)

SDHC Share \$424,281

(\$62,664 staff + \$361,617 contractual – landscape architecture, civil engineering & sign design)

PHASoCal – Public Health Task Force
\$164,825

Other Contractual Services \$261,225

(Engineering, landscape architecture, water system & sign design, community outreach)

6. CHALLENGES

PROJECT CHALLENGES

1. Administration
2. Appropriate venues for project dissemination, within administrative limitations
3. Agency silos
4. **Attention spans** – getting leadership of responsible organizations to buy in and advance the opportunities
5. **Actualizing** – translating plans into implementation vehicles other than grant-funded projects:
 - School modernization
 - Maintenance contracts
 - Regular building operations



7. LESSONS LEARNED

LESSONS LEARNED

1. Formal community leadership programs make INCREDIBLE partners!
2. Surface flow path mapping and social mapping tools engaged residents in water-friendly landscape design
3. Children, maintenance technicians, and teachers brought energy & knowledge to the challenge of changing our paradigm around non-potable water & xeriscape
4. Paths to financial support for landscape transformation & water capture are key
5. A shared water ethic & ethic of place is needed, regionally, as a basis for improving regulations & changing practice
6. Fears of change, cost, delay, and “rocking the boat” are persistent barriers to good practice for schools and publicly-managed housing.



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